

## Remarks

Claims 1, 4 and 9-13 were pending.

Claims 1, 9 and 10 are amended.

Claim 12 is cancelled.

Claim 14 is new.

Claims 4, 11 and 13 are as previously presented.

The application now contains claims 1, 4, 9-11, 13 and 14.

Claims 1 is amended to more adequately clarify the meanings of certain limitations. In the fourth line in the description of component c, the term "substituted" appearing prior to the term "ammonium" is deleted and the limitation "wherein the ammonium ion is substituted by from 1 to 4 alkyl groups containing a total of from 6 to 80 carbon atoms" is inserted at the end of line 5. In the second and third lines in the description of component e, the term "rosin(acid) metal resinate" is replaced with "metal rosinate", the terms "a pentaerythritol rosin" and "a vegetable oil based rosin ester" are deleted and the term "a maleinized rosin" is inserted. Support is found in the specification on page 4 lines 14-22 and page 5, lines 20-22.

Claim 9 is amended to insert the limitation "and from 0 to 5% by weight of additives selected from the group consisting of drying enhancers, drying inhibitors, non-coloured extenders, fillers, opacifiers, antioxidants, waxes, oils, surfactants, rheology modifiers, wetting agents, dispersion stabilizers, strike-through inhibitors, anti-foaming agents, adherence promoters, cross-linking agents, plasticisers, photoinitiators, deodorants, biocides, laking agents and chelating agents" to the end of the claim. Support is found in the specification on page 6 lines 11-18.

Claim 10 is amended to delete the unnecessary phrase "and optionally further customary additives" at the end of the claim.

Claim 14 is added to reclaim material deleted from claim 1. Although after final, the introduction of this new claim is proper as claim 12 was cancelled so that the number of claims remains the same, and the material of claim 14 was already under examination.

No new matter is added.

## Rejections

Claims 1, 4 and 9-13 are rejected under 35 USC 112 first paragraph as not being enabling, specifically in regards to the substituted ammonium groups.

Upon careful reading of the specification, it is clear that what is disclosed is an ammonium cation which is substituted by alkyl groups (plus, of course the counter ion). That is for example, the substituted ammonium carboxylate of the claim is carboxylate salt of the cation  $\text{NR}_4$  wherein R can be hydrogen or a selected alkyl substituent.

Applicants' respectfully submit that the instant amendments to claim 1 adequately define the ammonium salts commensurate with the disclosure of the specification and kindly ask that the 35 USC 112 first paragraph rejections be withdrawn.

Claims 1, 4 and 9-13 are rejected under 35 USC 112 second paragraph as it is unclear what the terms "rosin (acid) metal resinsates", "pentaerythritol rosin" "rosin-modified phenolic resin" and "vegetable oil based rosin ester" mean.

Applicants respectfully traverse the rejections.

Rosin(acid) metal resinsates were meant to signify rosin in the free acid form as well as metal salts of rosin. Applicants agree that the term may be confusing, especially as rosin as the free acid is already claimed and resinate is a misspelling, and have amend the claim to recite "metal rosinate", "rosin" appearing in the preceding line.

Pentaerythritol rosin and vegetable oil based rosin ester both refer to known esters made from rosin and either pentaerythritol or vegetable oil. As the term "resin ester" already appears in the claim, the terms were deleted as a multiple range and the entities explicitly claimed in new claim 14.

Rosin-modified phenolic resin refers to a commercial entity widely known in the filed, a description of which can be found in many textbooks and technical papers. Applicants have included extracts from Ullmans on line encyclopedia describing the above esters and rosin-modified phenolic resin.

Applicants respectfully submit that, in light of the above amendments and discussion, the rejections under 35 USC 112 second paragraph have been addressed and are overcome and kindly ask that the rejections be withdrawn.

Claims 1, 4 and 9-13 are rejected under 35 USC 103(a) as being obvious over Tregub et.al., US 6,099,631.

Applicants respectfully traverse the rejections.

Applicants respectfully note that the composition of instant claim 1 contains 5 components, each present in a fairly tight range:

- (a) 60 to 80% of an organic disazo, metal complex and/or naphthol pigment,
- (b) 2 to 6% of a specific type of hyperdispersant
- (c) 2 to 6% of a specific type of synergistic additive,
- (d) 3 to 8% of an aliphatic or aromatic hydrocarbon distillate fraction of boiling points in the range of 100 to 350°C or triglyceride vegetable oil with fatty acid moieties having a chain length of C12 to 24 carbon atoms, and
- (e) 2 to 30% of rosin or a modified rosin.

The instant composition is shown in the examples to provide excellent properties to lithographic inks.

Applicants respectfully contend that although one can find generic mention of the above components in Tregub, the disclosure of Tregub is no more of a listing of various components which may be present in a hot melt printing and offers no fair suggestion of the instant composition nor offers any guidance to the selection of the specific components of the compositions or the amounts of each required.

For example, while Tregub discloses a pigment composition, it is a composition for a mill base or concentrate to be used for a hot melt solid ink and comprises any pigment in the general range of 0.2–90%, the examples use 19 - 50% pigment, and "any organic solvent which is thermally stable, has good wetting properties, and is compatible with the other components of the ink." (col. 3 / lines 44 46). The only range disclosed for the solvent is 9–98.59%, the Examples all contain more than 30% oil or wax, typically much more. All other disclosed components are optional.

Applicants respectfully aver that at most one may argue that the instant ranges 60-80% pigment plus 3 to 8% solvent may be considered a small, unexemplified subset of Tregub. However, since the instant composition contains less solvent than that allowed by the only range of solvent found in Tregub, Applicants maintain that the instant composition is already shown to be outside of Tregub entirely. Furthermore, the instant composition requires specific amounts of other well defined components.

Tregub discloses a mill base which comprises about 0 to 40% of a plasticizer (Column 3 line 11) and 1-40% of a dispersing agent. Examples of possible dispersing agents include, but are not limited to, Solsperse 24000, Solsperse 20000, Solsperse 17000, 13940, 13240, 24000, 26000, 28000 and the like (column 3 line 61 to column 4 line 4). A synergist may also be present, examples of such synergists include, but are not limited to, Solsperse 5000, Solsperse 22000, and the like in a preferred ration of dispersant to synergist of 4:1 to 9:1 (column 4 lines 9-19). The Action states that the ratio 4:1 is similar to the largest ratio possible of dispersant to synergist in the instant composition, 3:1.

Applicants respectfully point out that there is no specific disclosure of the instant hyperdispersant; the Solsperse® range includes dispersants from many chemical types – for example, Solsperse® 5000 and Solsperse® 12000 are phthalocyanine sulfonic acid salts, Solsperse® 22000 is a benzidine yellow derivative, Solsperse® 24000 is a graft copolymer hyperdispersant based on ethylene imine and  $\epsilon$  caprolactam, and Solsperse® 27000 is  $\beta$  naphthol with a polyethylene oxide chain. Moreover, the structure of many Solsperse® products is confidential and cannot be determined easily. Further, the amount of dispersing agent is only disclosed in very broad terms (1–40%), with no specific value in the instantly claimed range.

Also, the absolute amount of synergist is not disclosed, only a ratio of 4:1 to 9:1 dispersant to synergist. The Action argues that if the dispersant of the instant composition is present in its maximum amount, 6%, the 4: 1 ratio of Tregub would provide 1.5% synergist, which is viewed as similar to 2% minimum of the instant invention. Applicants note that 1.5 is only 75% of 2 and question whether a skilled artisan would reasonably consider the uncertainty of a 2% number to be  $\pm 0.5\%$ , especially as the largest instant amount synergist is only 6%. One can not meet the instant limitations of dispersant and synergist using the disclosure of Tregub.

The instant invention also requires 2 to 30% by weight based on the weight of the composition of rosin or a modified rosin. One can find rosin esters mentioned in Tregub as an optional component of one of the embodiments. However, in Tregub rosin esters are not differentiated in any way from other possible resins. For example, column 4 lines 62 to 64 states "For the purpose of embodiments of present invention, resins used herein may be acrylic, hydrocarbon resins, aliphatic resins, rosin esters, polyamides and the like". Examples of possible acrylic, aliphatic and hydrocarbon resins are provided.

Thus, there is no specific delineation in Tregub of any component a-e of the instant composition. Further, one finds throughout Tregub the teaching that the amount of individual components "should be determined experimentally, but guideline ratios can be found in the typical formulations recommended by Zeneca United Color Technology, Inc". Thus, Applicants contend that the broad disclosure of Tregub that may resemble the instant composition is little more than a generic listing of commercially known components.

Applicants also wish to make the point that it is not just one specific amount of a single component or one specific ratio that differentiates the instant composition from the generic disclosure of Tregub. At no point does Tregub even suggest the 5 component mixture of the instant composition or provide any teaching that would guide one to the specific materials and specific amounts required therein. Applicants are of the opinion that one would certainly require "undue experimentation" to arrive at the instant composition based on the disclosure of Tregub and would still end up with a composition whose limitations are not met by said disclosure.

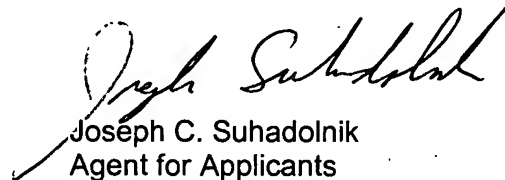
Regarding the lithographic printing ink of claim 9, Applicants respectfully aver that as they contain the composition of claim 1, the ink should also be considered allowable and non-obvious. However, Applicants further note that the instant amendments limit the ink of claim 9 to less than 5% of other additives. The inks of Tregub, which are made from a mill base which is formed into a concentrate then into an ink contain higher amounts of the additives listed, for example, waxes or plastisizers. Applicants believe that this is a physical embodiment of the difference between a hot melt ink of Tregub and the lithographic ink of the instant invention as discussed in the instant specification and previous correspondence. Enclosed herein is a selection from Ulmans on line regarding lithographic inks.

Based on the amendments and discussions above, Applicants submit that the limitations of the instant invention, that is the combination of no less than 5 essential components, which account for 95-100% of the total of an ink composition, each of which is a narrow chemical selection and is used in a specific narrow range amount is not suggested by nor can not be reasonably deduced from the disclosure of Tregub. Applicants therefore respectfully aver that the rejections under 35 USC 103(a) over Tregub et.al., US 6,099,631 are overcome and kindly ask that they be withdrawn.

Applicants respectfully submit that all objections and rejections have been addressed and are overcome and kindly ask that they be withdrawn and that claims 1, 4 and 9-11, 13 and 14 be found allowable.

In the event that minor amendments will further prosecution, Applicants request that the examiner contact the undersigned representative.

Respectfully submitted,



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Enclosed: extracts from Ulmans Online

## Drying Oils and Related Products

Standard Article

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### 8.8. Oil Boiling with Rosin, Copal, and Amber

In the past oils — and also drying oils — were used as solvent for different natural resins. The target was to convert the natural resins into a suitable form for application and to combine the film properties of the natural resins with the drying properties of the oil. The higher the melting point of the natural resins, the better the film properties. Copals were better than rosins, and amber was better than copals. To improve the properties of rosins, rosins were transferred into rosin salts with calcium and zinc, into rosin esters with glycerol and pentaerythrol, and

maleinized and esterified (⇒ Resins, Natural – Types). It was not easy to melt the high molecular natural resins (copals and amber) and starting in England special know-how was gathered for this process.

The combinations of oils, different natural resins and related products and siccatives formed the basis for the oil varnishes, the first industrially used coatings.

### 8.9. Oil Boiling with **Phenolic Resins**

When the natural resins became rare the investigation to prepare synthetic resins began. The first synthetic resins used for industrial coatings were the **phenolic resins** (⇒ Resins). But the normal **phenolic resins** (resols) are not compatible with oil. The first step to overcome the problem was the combination of **rosin-modified phenolic resins** with drying oils [124]. The second step was the preparation of so-called alkylphenolic resins (from alkyl-substituted phenols) [125], [126]. These alkylphenolic resins are able to react with oils, preferable tung oil, to yield adducts between the double bond system and the methylol and OH group of the **phenolic resin** [127]. The process is carried out at 240 °C, using a mixture of 2 – 4 parts tung oil and 1 part alkylphenolic **resin**. The reaction products have good drying properties and the films are highly resistant to water and chemicals. The product were used for industrial coatings and especially for yacht varnishes. For this application they were much more suited than alkyd varnishes. These combinations are often replaced by polyurethane coatings, but yacht varnishes are still available.

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## Phenolic Resins

Standard Article

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## 1. Introduction

[...]

**Modified Phenolic Resins.** Rosin, a natural resin (  $\Rightarrow$  Resins, Natural), contains abietic acid and its double bond isomers as main components. Resols react with the unsaturated centers of these resin acids to form polycarboxylic acids with methylene bridges [9].

These condensation products from rosin and phenol – formaldehyde resin are known as **albertol acids**. They can be converted by esterification with polyols, or by salt formation, into higher molecular mass products which are readily soluble in nonpolar solvents but can release the solvent rapidly.

Albertol acids are also obtained by direct condensation of rosin, phenols, and formaldehyde.

Resols also undergo analogous reactions with other natural or synthetic unsaturated compounds such as fatty oils, rubbers, and polymer oils. A limited increase in the molecular mass or cross-linking can thus be achieved. Whether a particular reaction can be carried out successfully depends on the ratio of the rates of auto-condensation of the starting materials to co-condensation with the other reaction partners, but particularly on their mutual compatibility. Phenolic resins are therefore often classified as "water-soluble", "alcohol-soluble", "oil-soluble" etc.

Compatibility of resols with other components can be produced in many ways, e.g., (1) by using ring-alkylated phenols as the raw materials; (2) by etherification of the hydroxymethyl groups with alcohols; (3) by co-condensation of the resol with natural resins; or by a combination of these measures.

[...]

### 4.3. Phenolic Resins Modified by Natural Resins

The reaction of preformed resols with rosin to give albertol acids (see Modified Phenolic Resins.) is carried out in a melt at 100 – 200 °C. The albertol acids are subsequently reacted with polyols to give polyesters or with metal oxides to give resinates (both procedures can also be combined). These reactions must be carried out at temperatures of up to 280 °C because the tertiary carboxyl groups of the abietic acids are only esterified slowly and the melt viscosities and softening points of the rosin-modified phenolic resins can be very high. Suitable resol components are the reaction products of formaldehyde with phenol, cresols, alkylphenols, or bisphenol A, or mixtures of these. The properties of the resins are determined by the composition and structure of the resol, the resol – rosin ratio, and the nature and quantity of the polyols or metal oxides used for the subsequent reaction. The modified phenolic resins vary greatly with respect to viscosity, softening point, miscibility with solvents, and compatibility with varnish or printing ink raw materials.

The reaction sequence between rosin, resol, and esterification components can also be reversed. In this case the natural resin acids are first esterified and the esters are then reacted with resols.

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## Imaging Technology

Standard Article

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#### 3.4.1. **Lithography** (Planographic Printing, Offset)

**Lithography** was invented by SENEFELDER in Munich in 1797. Because he used limestone from Solnhofen as the carrier, this method is called "writing on stone" or **lithography**. The American W. RUBELS made **lithography** an industrially useful printing process, by transferring the printing ink from the plate to an intermediate carrier, the rubber blanket, and then from the blanket to printing paper (offset).

Because of its technological characteristics, **offset printing** is widely employed worldwide in the production of high quality one- and multicolor prints for medium runs in advertising material, calendars, art prints, books, brochures, newspapers, and packaging. Runs ranging from 10000 to 250000 are typical, but under certain press conditions, much higher runs are achievable.

An important characteristic of **offset printing** is that platemaking is simple, quick, and economical. On a suitable hydrophilic carrier (e.g., a plastic film coated with silicates in a binder) oleophilic image areas can be made by hand or with a typewriter for simple black and white line work.